

PSYCHE.

DESCRIPTIONS OF SOME NEW NORTH AMERICAN DOLICHOPODIDAE.

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Since the publication in 1864 of Loew's admirable Monograph of the North American *Dolichopodidae*, very little work has been done on these interesting diptera. Baron v. Osten Sacken in his "Western diptera," published in 1877, described from California nine new species, belonging to the genera *Hygroceleuthus*, *Dolichopus*, *Tachytrechus*, *Liancalus*, *Scellus* and *Poly-medon*. The last is a new and very peculiar genus. Mik. in 1878 (Verhand. d. zoolog. bot. gesell. p. 617-632) described one new North American species for which he erected the genus *Hypocharassus*. More recently, in 1888, Bigot (Bull. soc. ent. France XXIX, XXX) has described eight new species from Hayti, Mexico, North Carolina and California, representing several new genera.

Barring these contributions, our knowledge of the North American *Dolichopodidae* has made no advance since Loew's time. This is not to be attributed to inattention on the part of living dipterologists, but rather to the thoroughness of Loew's work. From

a taxonomic standpoint little is left to the ἐπιγνοοί besides the filling out of the unavoidable gaps in the work of the master entomologist.

Like other students of our diptera, who have given some attention to the *Dolichopodidae*, I can add very little to Loew's work. With three exceptions the species here described fall naturally into genera defined and adopted by Loew. For these three exceptions I have erected two new genera, *Peloro-peodes* and *Aphantotimus*, based, I believe, on sufficiently distinctive characters. The former, including as yet only one species, *P. salax*, is allied to *Rhaphium*; the latter, to which I assign two species, *A. willistoni* and *A. fraterculus*, is allied to *Chrysotimus*. *Peloro-peodes* is interesting as forming a link between those higher forms, which, like *Dolichopus*, have large disengaged hypopygia and the genera like *Rhaphium*, *Porphyraps* and its allies, which have the third antennal joint elongated, tapering, with apical arista, and the hypopygium small and more or less imbedded. *Aphantotimus* appears to

form a similar link between the *Dolichopus*-like forms and the species of the genus *Chrysotimus*.

DOLICHOPUS ALBICILIATUS, Loew. ♂.

Length 6 mm.; length of wing 4.5 mm.

Face narrow, covered with silvery white dust. Antennae black, third joint small, rounded anteriorly. Front dark bluish green; cilia of the superior orbit black, those of the inferior orbit pale yellow. Thoracic dorsum shining dark metallic green; pleurae black, anteriorly, with greenish bronze reflection, posteriorly dusted with white. Tegulae with black cilia. Scutellum dark green with violet reflection. Abdomen dark bluish green, the terga of the first and second segments with violet reflection; incisures broadly black; venter black, powdered with white dust; hypopygium black, opaque, with pale dull yellow lamellae of subtriangular outline, apical margin rather evenly crenulate, broadly bordered with black and fringed with delicate long hairs; penis and other appendages pale yellow. Coxae opaque black, tipped with yellow; the anterior pairs with several curved black bristles on their fore faces; all the femora black, with metallic green reflection, broadly tipped with yellow; anterior tibiae pale yellow, with black setae, which are conspicuously long on the fore pair; anterior tarsi pale yellow, blackened from the tip of the first joint; hind femora ciliated with long and delicate hairs on their inner faces; hind tibiae slightly incrassated, pale yellow with their apical third black; hind tarsi black, the metatarsal joint slightly incrassated. Halteres dull yellow. Wings grayish hyaline; veins black; the juncture of the first longitudinal vein with the costa thickened, though not to the degree observed in the males of some allied species; last section of the fourth vein appearing considerably steeper than in the ♀ and meeting the costa nearer the end of the third vein.

HABITAT: Wisconsin.

Only the female of *D. albiciliatus* was known to Loew. In view of the fact that the male is from a taxonomic standpoint by far the more important sex in the study of the *Dolichopodidae*, I have in this as in the case of a few of the other species, of which the males were unknown to Loew, inserted a description.

DOLICHOPUS INCONGRUUS, n. sp. ♂.

Length 5 mm.; length of wing 4.75 mm.

Dark metallic green. Palpi black; face narrow, silvery white. Antennae large, entirely black, the two basal joints short and small; third joint unusually large, flattened, suboval, dorsal contour straight with the arista inserted near its middle, ventral contour evenly rounded. Pubescence of the eyes distinct, white. Cilia of both the superior and inferior orbits black. Front and thoracic dorsum deep metallic green, the latter with a cupreous reflection in the median line and on its humeral edges; pleurae black, dusted with white. Tegulae yellow with yellow cilia. Scutellum and abdomen deep metallic green varied with cupreous; venter black, covered with white dust; hypopygium large, swollen, black with metallic green reflection and white dust; penis and internal appendages yellow; lamellae small, elongate oval, tapering but rounded at their tips, edges black, scarcely jagged and fringed with short and weak black hairs. Coxae black, and like the pleurae, dusted with white; apical third of the anterior face of the fore coxae and tips of the posterior coxae yellow; the usual tufts of black hairs on the anterior faces of the fore and median pairs and a single backward directed seta on the lateral face of the hind coxa. Fore legs yellow; the basal two-thirds of the femora black; tarsi about as

long as the fore tibiae. plain, being neither attenuated nor infuscated. Median legs pale yellow throughout; femora with preapical bristle. Hind femur eciliate, black, with yellow tip and with preapical bristle; tibia setose, not incrassated, with its anterior face and tip black, its base and posterior face yellow the latter with five prominent setae; tarsi entirely black. Halteres yellow. Wings gray, hyaline; the venation resembling that of other dark-legged species of *Dolichopus*; costa presenting a short but distinct swelling at the juncture of the first longitudinal vein; this swelling does not interrupt the straight outer contour of the costa but bulges out distinctly on its inner edge; veins black posterior cross-vein forming right angles with the fifth longitudinal vein. The base of the wing is rather acute.

HABITAT: Milwaukee Co., Wis.

This species is to be admitted to the group comprising Loew's *D. pachycnemus* and *brevipennis*, both of which are characterized by having the cilia of the inferior orbit black, while the prevailing color of the legs is yellow. The male *incongruus* differs from the males of both of Loew's species in having the tegular cilia yellow, in the coloration of the legs, in having the fore tarsi plain and the hind femora eciliate. There are several other differences but these will suffice to separate the species.

DOLICHOPUS SCOPARIUS, Loew. ♂.

A male agreeing closely with Loew's description of this species was sent me from Mass. by Mr. S. Henshaw. The hypopygial lamellae were so nearly destroyed in the single specimen from which Loew's description was taken

that he could only affirm that they were yellow. In my specimen they are well preserved and very unlike the hypopygial lamellae of other species of *Dolichopus* known to me. They are rather large, entirely pale yellow, of a rhomboidal shape, and have their somewhat swollen edges smooth and entire, not jagged as in other species. The upper (or when the hypopygium is flexed back in line with the abdomen, the under) edge is slightly twisted, folded in and fringed with delicate black hairs, which I take to be the homologues of the ragged fringe so characteristic of most species.

DOLICHOPUS FLAGELLITENENS, n. sp. ♂.

Length 5 mm.; length of wing 4.5 mm.

Rather dark metallic green. Palpi yellow, black at their tips. Face about the normal breadth for a male, overlaid with yellowish gray dust. Antennae of medium size; first joint yellow, with the usual black hairs conspicuous; second joint yellow with its dorsal half black; third joint small, rounded, black, blunt anteriorly; arista rather robust, blackish with short white pubescence. Front metallic green with coppery reflection; cilia of the inferior orbit short, yellow. Thoracic dorsum dusted in front with white, the median line coppery; humeral callosity concolorous with the dorsum. Scutellum with a large coppery spot on each side of the median line. Pleurae dull metallic green dusted with white posteriorly. Tegulae with black cilia. Abdomen with coppery reflection; venter overlaid with white dust: hypopygium black, lamellae of moderate size, suboblong, white, upper edge infuscated and fringed with rather weak black hairs. Fore coxae yellow, blackened only at their bases; beset in front with several long and conspicuous black setae; posterior coxae concolorous

with the pleurae, their tips only yellow; the median pair fringed, like the fore pair, with black setae. Legs yellow; fore tibiae provided with a few prominent black setae; tarsi $1\frac{1}{2}$ times as long as the tibiae; first and second joints attenuated, stalk-like, both together equalling the tibiae in length; second joint thinner than the first and about $\frac{2}{3}$ as long; third and fourth joints of about equal length, both together about half as long as the second joint. The fourth joint, which is yellow at its extreme base, but otherwise black, is broader than the third joint; fifth joint flattened out into a large oval black disk, densely fringed on its anterior edge with short black hairs and provided with a small and inconspicuous tuft of silvery hairs near the insertion of the claws. Median femur with a preapical bristle; tibia with rather prominent black spines; tarsus plain, blackened from the tip of the first joint. Hind femora eciliate, with preapical bristle; hind tibiae distinctly incrassated; apical half black; setae prominent; a rather dense covering of shorter black hairs, especially on the inner face, which presents a smooth streak longitudinally coextensive with the black coloring; hind tarsi black, metatarsal joint a little thickened; its extreme base yellow. Halteres yellow. Wings more brownish than grayish hyaline; veins dark brown; costa slightly thickened where it meets the first longitudinal vein; fourth vein presenting the usual double flexure; posterior cross-vein meeting the fifth longitudinal vein at right angles.

HABITAT: Milwaukee Co., Wis.

This species is related to several North American dolichopodes. In general appearance it approaches *D. batillifer*, Loew, from which it may, however, be very readily distinguished by the color of the antennae, tegular cilia and hind femora. The dilated fifth tarsal joint of the fore foot is in my

species deep velvety black, whereas in *batillifer* it is more brownish and covered with minute silky hairs which make it resemble a silver reflector when viewed from the proper angle.

In the color of its hind tarsi *D. palaestricus*, Loew, approaches *flagellitenens* more closely than does *batillifer*. Loew's species, however, has entirely black antennae, pale tegular cilia and entirely yellow hind tibiae. Both *batillifer* and *palaestricus* have the hind femora ciliated, the former more abundantly, the latter less so, while the hind femora of *flagellitenens* are eciliate.

DOLICHOPUS HENSHAWI, n. sp. ♂.

Length 5—5.5 mm.; Length of wing 5—5.5 mm.

Metallic green, changing to coppery and violet. Palpi pale, blackened at their ends. Face rather narrow, overlaid with ochre-yellow dust. Antennae small, reddish yellow; basal joint smooth on its under surface, the black hairs on its upper surface, as also those on the second joint, stiff and rather conspicuous; third joint small, smooth, not much flattened, ending in a short, acute point; apical half black; arista robust. Front metallic violet, moderately shining; cilia of the superior orbit black, those of the inferior orbit yellow. Thoracic dorsum resplendent coppery green, passing into violet on the scutellum; pleurae metallic green, subdued by a layer of silver gray dust. Cilia of the tegulae black. Abdomen with resplendent cupreous reflection especially in the median dorsal line; hypopygium black with dull metallic green base, and pale yellow lamellae and internal appendages; the former are quite large and shaped like isosceles triangles with rounded angles; the two sides forming the apical angle by which the lamella is attached are not infuscated though fringed with a few short and weak yellow hairs; the two other angles are narrowly

blackened and fringed with rather coarse black bristles as is also the side included by them. Fore coxae pale yellow, their extreme base, only blackened; posterior coxae for the most part concolorous with the pleurae and covered with the same silver-gray dust; on their tips, however, this dark coloring passes into pale yellow. The anterior coxae are covered on their fore faces with black hairs, some of which are long and conspicuous, though a greater number are short and evenly distributed.

Legs pale yellow; apical sixth of fore tibia somewhat incrassated, blackened and provided with several prominent flattened black hairs on its anterior face. These hairs are so graduated in length as to make the tip of the tibia seem more incrassated than it really is. Fore tarsus $1\frac{1}{2}$ times as long as the fore tibia; first joint about $\frac{1}{2}$ as long as the tibia, blackened at its tip, its base on the anterior side bared of the small black hairs which cover the joint; hence, at first sight, this joint seems to have a pale spot where it joins the tibia; second joint somewhat longer than the third, second and third together about equal to the first joint; fourth joint about a third as long as the preceding joint, black, except at its base, and somewhat broader than any of the preceding tarsal joints; fifth joint considerably dilated, flattened, oval, dark brown, fringed with short black hairs on its outer edge. The claws are inserted on the middle of the inner long side of the oval; hence the dilatation of the fifth joint has not taken place, as in some other species, at right angles to the long axis of the tarsus, but obliquely. Median femur with preapical bristle; median tarsi dark brown or black from the tip of the first joint. Hind femora with short preapical bristle, ciliated on both their anterior and posterior edges. The posterior cilia are black, very long and form a series extending nearly the entire length of the posterior face; near the base of the femur, however, they become much shorter and pale yellow; the cilia of the anterior edge are all

black, much shorter and occur only on the basal half of the femur. Hind tibiae somewhat incrassated with infuscated tips; the usual setae are long and conspicuous; on the inner face a dark brown band runs from the insertion of the tibia to its middle, where it ends in a point; the infuscated tip of the tibia sends out a much shorter dark brown band which stops before reaching the basal band. Hind tarsi deep black, the metatarsal joint a little thickened. Halteres honey yellow. Wings uniformly grayish hyaline with brown veins; costa slightly thickened where it meets the first longitudinal vein; fourth longitudinal vein not broken, but exhibiting the usual double flexure; posterior cross vein meeting the fifth longitudinal vein nearly at right angles.

HABITAT: Massachusetts.

This species may be easily distinguished from all described North American species of *Dolichopus* by the peculiar coloring and conformation of the fore feet. The description is taken from three males sent me by Mr. S. Henshaw.

DOLICHOPUS GERMANUS, n. sp. ♂. ♀.

♂ Length 4.—5 mm.; length of wing 4.—4.5 mm.

Metallic green, not very bright. Palpi pale yellow, face rather narrow, silvery white. Antennae of the same shape as in *D. variabilis*, smooth, red; first joint rather long, cuneate; second joint short and broad; third joint of moderate size, about as broad as long; apical half infuscated, ending in a short but acute point; arista inserted on about the middle of its dorsal contour. Front subdued metallic green; cilia of the superior orbit black, on the inferior orbit dirty white. Thoracic dorsum metallic green with a golden reflection, dusted in front with yellowish scales; pleurae metallic green, becoming pearly from a covering of white

dust. Cilia of the tegulae black. Scutellum concolorous with the thoracic dorsum. Abdomen metallic green, passing into cupreous on the apical half; venter dusted with white, its short hairs pale yellow; hypopygium large, black, with metallic green reflection on its basal half, thinly covered with white dust; penis and internal appendages pale yellow; lamellae white, of moderate size and irregularly trigonal shape; apical margins rather broadly bordered with black and broken into a jagged fringe of bristles, which seem to be white with black bases. From the posterior edge of each lamella projects a broad, flat, bifurcate bristle. Coxae and legs pale yellow; the latter dusted with silvery white dust. Fore coxae covered with short white hairs anteriorly and bearing several conspicuous black bristles near their tips; the median coxae have, besides a few long and curved black hairs on their anterior faces, a long and straight black seta on the lateral face near the tip and a brown spot at the base; hind coxa near its tip with a black bristle which is only about $\frac{2}{3}$ as long as the corresponding one on the median coxa. Fore tarsus plain, about $1\frac{1}{2}$ times as long as the fore tibia, the last joint but very slightly, if at all, dilated, black, contrasting with the pale yellow of the other tarsal joints. Posterior femora each with a prominent preapical bristle; the hind pair eciliate; the black bristles of the posterior tibiae well developed and conspicuous; median tibiae with four equal setae at their tips; posterior tarsi blackened from the tip of the first joint; usually on the median pair the second joint and the tip of the first are more dark brown. Halteres pale yellow. Wings hyaline, with a brownish tinge; narrow at their bases and somewhat pointed at their apices; veins yellow; one or both of the angles of the double flexure in the fourth longitudinal vein somewhat more acute than in many species of *Dolichopus*. The posterior cross-vein, though perpendicu-

lar to the fourth longitudinal vein, forms an angle less than 90° with the fifth longitudinal vein.

♀. Length 4.5 mm.; length of wing 4.5 mm.

Face twice as broad as in the male. Third antennal joint infuscated to a less extent and ending in a slightly shorter and blunter point. The terminal joint of the fore tarsus seems to be a little narrower than in the male, though it is also accentuated with black. Otherwise the female very closely resembles the male.

HABITAT: Milwaukee Co., Wis.

I have examined 15 males and 18 females of this species and, with a single exception, find the coloring approximately constant as I have described it. The species is closely allied to Loew's *D. variabilis*, in whose company I have several times taken it. The males of the two species may, however, be readily separated by attending to the following points:

D. variabilis: Face yellow; cilia of the tegulae yellow; fore tarsi blackened from the tip of the first joint; hind femora ciliated.

D. germanus: Face white; cilia of the tegulae black; only the terminal joint of the fore tarsi black; hind femora eciliate.

The pale hairs on the venter of the male specimens of *variabilis* in my possession are very much longer than in *germanus*. The hypopygial lamellae, too, have a different outline and more jagged edge with several flattened bifurcate bristles. The females of the

two species differ, as is the rule in the genus, much less than the males. The female *variabilis* has pale cilia on the tegulae and the fore tarsus blackened from the tip of the first joint, whereas the female *germanus* has black tegular cilia and only the terminal joint of the fore tarsus black. I have seen one female, the exception above alluded to, that had half of the tegular cilia yellow, and half of them black.

I am quite certain that the female *germanus* was known to Loew. He says, after mentioning the fact that *D.*

variabilis is more variable in the coloring of the posterior tarsi than is usually the case with the species of the genus *Dolichopus*: "I possess also some other females which I can only distinguish from the above described ♀ of *D. variabilis* by their black ciliated tegulae." It seems therefore that either the females vary in the coloring of the cilia, or that we have here two exceedingly similar species." Loew with his usual care and circumspection did not venture to describe these females as a new species.

(To be continued.)

NOTES ON THE STRUCTURE AND HISTORY OF HAEMATOBIA SERRATA.

BY JOHN B. SMITH, NEW BRUNSWICK, N. J.

During the summer of 1889 the alarm occasioned by the appearance in excessive numbers of this species, known as the "Horn Fly," induced me to study some of the structures rather carefully to demonstrate the impossibility of injuries such as were charged to the fly. The result of these studies appeared in popular form in Bulletin 62 of the New Jersey Experiment Station, and as they cover some ground not heretofore trodden, I give some of them in a more technical and condensed form to the entomological public.

The mouth parts were more particularly studied—not so carefully as the

studies made on some other species by Dr. Dimmock, but simply to show the gross anatomy. In this species the opercular sheath is a ringed structure, enlarged basally and roughly shaped like an "Indian Club." The tube is not complete, but there is an infolding above and in front of the sheath which, while making it practically tight, gives a wide range of motion in enlarging and contracting. On the outer side this sheath is furnished with rather sparse hair set into deep pits, evidently tactile and specialized, and not mere pubescence. In general structure *Stomoxys calcitrans* which was studied